
Preface

This book highlights methodological challenges encountered in pursuit of research critical for developing cost-effective technologies for conversion of biomass to transportation fuels and chemicals. The book begins with an overview chapter discussing the special needs and pitfalls encountered in conducting original biomass conversion research. In brief, biomass conversion research is a combination of basic science, applied science, and engineering testing and analysis. To conduct this work effectively, it is important to understand the essential characteristics of the feedstock considered for conversion. Conversion science includes the initial treatment (called pretreatment) of the feedstock to render it more amenable to enzyme action as well as the saccharification and chemical/biochemical conversion steps that follow. Based on this view, the book is divided into three high-level topics which include Biomass Feedstocks and Cellulose, Plant Cell Wall-Degrading Enzymes and Microorganisms, and Lignin and Hemicelluloses. Each chapter within these general themes stresses the state of the problem as well as methodological challenges encountered in conducting research and ways to improve existing methods or the introduction of new methods. It is our intention that this book will benefit both scientists working to understand the fundamental problems associated with biomass conversion research and chemical and mechanical engineers working to design new conversion processes. The conceptualization and construction of this book was funded by the BioEnergy Science Center (BESC), which is a U.S. Department of Energy Bioenergy Research Center supported by the Office of Biological and Environmental Research in the DOE Office of Science as well as the U.S. Department of Energy Office of the Biomass Program (OBP).

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